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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,684	01/15/2004	Andreas H. von Flotow	367618014US1	4952

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EXAMINER	
SHEPARD, JUSTIN E	

ART UNIT	PAPER NUMBER
2623	

MAIL DATE	DELIVERY MODE
06/29/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/758,684	VON FLOTOW ET AL.	
	Examiner	Art Unit	
	Justin E. Shepard	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/17/07 has been entered.

Response to Arguments

Applicant's arguments with respect to claims 1, 9 and 18 (plus any dependent claims) have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 4/17/07 as relating to claim 28 have been fully considered but they are not persuasive.

The applicant argues that neither Brunner, Kato, or Riconda disclose a system in which dynamic adjustments are performed on the camera velocity. Looking at figure 14 of Kato, the flow chart shows that steps 84, 85, and 86 are repeated while the object is in range of the camera. Step 85 specifically refers to turning the camera, which in column 8 lines 47-51 refers to setting an angular velocity. As the velocity is adjusted more than once, this is interpreted as adjusting the camera velocity dynamically.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 3, 6, 7, 9, 10, 11, 12, 13, 16, 18, 19, 20, 21, 25, 28, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner in view of Kato in further view of Riconda in view of Jones

Referring to claim 1, Brunner discloses a method for controlling the line of sight of a camera to remain fixed on a target (column 2, lines 20-23), the camera being on a vehicle whose current position is moving at a velocity relative to a current position of the target (column 2, lines 23-24), the method comprising: setting an initial line of sight for the camera that is aimed at the current position of the target (column 1, lines 31-38); determining a static adjustment including periodically setting the line of sight of the camera based on an adjustment angle that is calculated to compensate for a difference between a needed line of sight derived from the current position of the vehicle and the current position of the target and the current line of sight of the camera (column 3, lines 51-61; column 2, lines 20-23); and maintaining the line of sight of the camera as the attitude of the vehicle changes relative to the current position of the target.

Brunner does not disclose a method for determining a dynamic adjustment including setting an angular velocity for moving the line of sight of the camera, the angular velocity being calculated based on the velocity of the vehicle and the current

position of the vehicle relative to the current position of the target to compensate for the current velocity of the vehicle relative to the target; and combining the determined dynamic and static adjustments.

In an analogous art, Kato teaches a method for determining a dynamic adjustment including setting an angular velocity for moving the line of sight of the camera, the angular velocity being calculated based the current position of the target relative to the current position of the camera to compensate for the current velocity of the target relative to the camera; and maintaining the line of sight in accordance with the set angular velocity relative to the current position of the target (column 8, lines 1-4, 10-12 and 42-50; figure 14).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the image based angular velocity tracking of Kato to the airborne position tracking system disclosed in Brunner. The motivation for doing this would have been to allow for the system to set an angular velocity, which would make for a smoother tracking and therefore result in a less shaky image.

Brunner and Kato do not disclose a method wherein the angular velocity is set based on the velocity of the vehicle, relative to the target; and combining the determined dynamic and static adjustments.

In an analogous art, Riconda teaches a method wherein the angular velocity is set based on the velocity of the vehicle, relative to the target (column 10, lines 6-16).

At the time of the invention it would have been obvious for one of ordinary skill in the art to modify the system disclosed by Brunner and Kato to use the vehicle velocity,

relative to the target, to determine the angular velocity as taught by Riconda. The motivation would have been that using the vehicle's velocity and direction would be a more accurate way of calculating the angular velocity, which would make for a smoother tracking and therefore result in a less shaky image.

Brunner, Kato and Riconda do not disclose a system for combining the determined dynamic and static adjustments.

In an analogous art, Jones teaches a system for combining the determined dynamic and static adjustments (column 6, lines 9-21 and 44-48).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the combining of dynamic and static measurements method of Jones to the airborne position tracking system disclosed by Brunner, Kato and Riconda. The motivation for doing this would have been to add the ability to track objects with higher accuracy therefore creating higher quality images (Jones: column 1, lines 25-35).

Claims 9, 18, and 28 are rejected on the same grounds as claim 1.

Referring to claim 2, Brunner discloses a method where the target is at a fixed position (column 2, line 21).

Referring to claim 3, Brunner discloses a method where the vehicle is airborne (column 2, lines 22-23).

Referring to claim 6, Brunner discloses a system where the initial line of sight of the camera is set based on the current position of the target and the current position and attitude of the vehicle (column 1, lines 31-38).

Referring to claim 7, Brunner discloses a method of claim 1, wherein the attitude includes pitch, roll, and heading (column 6, lines 14-17 and 21-25; Note: attitude is defined as orientation of an aircraft's axes relative to a reference line or plane, which is interpreted to be equivalent to the aircraft's azimuth as disclosed in Brunner).

Referring to claim 10, Brunner discloses a method where the target is at a fixed position (column 2, line 21).

Referring to claim 11, Brunner discloses a method where the device is a camera (column 2, line 20).

Referring to claim 12, Brunner discloses a method where the vehicle is airborne (column 2, lines 22).

Referring to claim 13, Brunner and Kato do not disclose a method where the vehicle is land based.

In an analogous art, Riconda teaches a method where the vehicle is land based (page 2, paragraph 21; page 3, paragraph 62).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the vehicle disclosed by Brunner and Kato with the land based vehicle from Riconda. The motivation for doing so would have been to track objects from a remote location unknown to the object that you are tracking, which would most likely be inaccessible by aircraft.

Referring to claim 16, Brunner discloses a system where the initial orientation of the device is set based on the current position of the target and the current position and attitude of the vehicle (column 1, lines 31-38).

Referring to claim 19, Brunner discloses a method where the target is moving (column 2, line 26).

Referring to claim 20, Brunner discloses a method where the device is a camera (column 2, line 20).

Referring to claim 21, Brunner discloses a method where the vehicle is airborne (column 2, lines 22-23).

Referring to claim 25, Brunner discloses a system where the initial orientation of the device is set based on the current position of the target and the current position and attitude of the vehicle (column 1, lines 31-38).

Referring to claim 31, Brunner discloses a method of claim 28 wherein the calculation for the static adjustment is performed at a time interval (figure 14).

Referring to claim 32, Brunner discloses a method of claim 31 wherein the orientation is statically adjusted once a time interval (figure 14).

Claims 4, 5, 14, 15, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner in view of Kato in view of Riconda in view of Jones as applied to claim 1 above, and further in view of EO Target Geolocation Determination.

Referring to claims 4 and 5, Brunner discloses a method where the initial line of sight of the camera is set based on an operator centering the line of sight of the camera on the target (column 4, lines 55-58).

Brunner, Kato, Riconda and Jones do not disclose a method that calculates the current position of the target based on the current position of the vehicle and altitude of the target.

In an analogous art, EO Target Geolocation Determination teaches a method to calculate the current position of the target based on the current position of the vehicle and altitude of the target (page 6, figure 3; Note: The only inputs to the system are location of the sensor, the line of sight attitude, and the image; and the output is the location of the target).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the method disclosed in EO Target Geolocation Determination to

the method disclosed by Brunner, Kato, Riconda, and Jones to add the ability to record the locations of objects observed by the imaging system to be used at a later time; for example it could be used to look for downed planes and have the ability to record their position for later use by a rescue team.

Referring to claim 14 and 15, Brunner discloses a method where the initial line of sight of the camera is set based on an operator centering the orientation of the device on the target (column 4, lines 55-58).

Brunner, Kato, Riconda, and Jones do not disclose a method to calculate the current position of the target based on the current position of the vehicle and difference in altitude of the target between the current position of the vehicle and the current position of the target.

In an analogous art, EO Target Geolocation Determination teaches a method to calculate the current position of the target based on the current position of the vehicle and difference in altitude of the target between the current position of the vehicle and the current position of the target (page 6, figure 3; Note: The only inputs to the system are location of the sensor, the line of sight attitude, and the image; and the output is the location of the target).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the method disclosed in EO Target Geolocation Determination to the method disclosed by Brunner, Kato, Riconda, and Jones to add the ability to record the locations of objects observed by the imaging system to be used at a later time; for

example it could be used to look for downed planes and have the ability to record their position for later use by a rescue team.

Referring to claims 23 and 24, Brunner discloses a system where the initial orientation of the device is set based on an operator centering the orientation of the device on the target (column 4, lines 55-58).

Brunner, Kato, Riconda, and Jones do not disclose a system for calculating the initial position of the target based on the initial position of the vehicle and an initial difference in altitude between the vehicle and the target.

In an analogous art, EO Target Geolocation Determination teaches a system for calculating the initial position of the target based on the initial position of the vehicle and an initial difference in altitude between the vehicle and the target (page 6, figure 3; Note: The only inputs to the system are location of the sensor, the line of sight attitude, and the image; and the output is the location of the target).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the method disclosed in EO Target Geolocation Determination to the method disclosed by Brunner, Kato, Riconda, and Jones to add the ability to record the locations of objects observed by the imaging system to be used at a later time; for example it could be used to look for downed planes and have the ability to record their position for later use by a rescue team.

Claims 8, 17, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner, Kato, Riconda, and Jones as applied to claim 1 above, and further in view of Williams.

Referring to claim 8, Brunner, Kato, Riconda, and Jones do not disclose a method where a gyroscope is used to maintain the line of sight of the camera.

In an analogous art, Williams teaches a method where a gyroscope is used to maintain the line of sight of the camera (column 1, lines 62-64).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the gyroscope from Williams to the tracking method disclosed by Brunner, Kato, Riconda, and Jones. The motivation for doing so would have been to stabilize the camera from vibrations (column 2, lines 28-35).

Referring to claim 17, Brunner, Kato, Riconda, and Jones do not disclose a method where a gyroscope is used to maintain the orientation of the device as the vehicle maneuvers.

In an analogous art, Williams teaches a method where a gyroscope is used to maintain the orientation of the device as the vehicle maneuvers (column 1, lines 62-64).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the gyroscope from Williams to the tracking method disclosed by Brunner, Kato, Riconda, and Jones. The motivation for doing so would have been to stabilize the camera from vibrations (column 2, lines 28-35).

Referring to claim 26, Brunner, Kato, Riconda, and Jones do not disclose a system where a gyroscope is used to maintain the orientation of the device as the vehicle maneuvers.

In an analogous art, Williams teaches a method where a gyroscope is used to maintain the orientation of the device as the vehicle maneuvers (column 1, lines 62-64).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the gyroscope from Williams to the tracking method disclosed by Brunner, Kato, Riconda, and Jones. The motivation for doing so would have been to stabilize the camera from vibrations (column 2, lines 28-35).

Referring to claim 27, Brunner, Kato, Riconda, and Jones do not disclose a system were the adjustment rate is angular velocity of a gimbal on which the device is mounted.

In an analogous art, Williams teaches a system were the adjustment rate is angular velocity of a gimbal on which the device is mounted (column 1, lines 56-62; figure 2; Note: part 30 is referred to as the angle of error between the LOS and the platform axis; the error would be in the same direction as the movement and therefore the gimbal movement can be measured in the units of angular velocity).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the device mount disclosed in Brunner, Kato, Riconda, Jones with the gimbal disclosed in Williams. The motivation for doing so would have been to

decrease the size of the device mount, the small size being shown by the gimbal being located inside of a missile, and therefore decrease the effect of the wind on the vehicle.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner, Kato, Riconda, and Jones as applied to claim 18 above, and further in view of Antikidis.

Referring to claim 22, Brunner, Kato, Riconda, and Jones do not disclose a system where the vehicle is space based.

In an analogous art, Antikidis teaches a system that adjusts for movement while taking still pictures where the vehicle is space based (column 2, lines 10-12; column 2, lines 35-38).

At the time of the invention it would have been obvious to a person of ordinary skill in the art to replace the vehicle disclosed in Brunner, Kato, Riconda, and Jones with the space vehicle from Antikidis. The motivation for doing so would have been to enable the system to track objects in close proximity of a spacecraft.

Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner in view of Kato in view of Riconda in view of Jones as applied to claim 28 above, and further in view of Koyanagi.

Referring to claim 29, Brunner, Kato, Riconda, and Jones do not disclose a method of claim 28 wherein the calculation for the dynamic adjustment is performed at a time interval.

In an analogous art, Koyanagi teaches a method of claim 28 wherein the calculation for the dynamic adjustment is performed at a time interval (figure 6).

At the time of the invention it would have been obvious for one of ordinary skill in the art to perform the calculation for the dynamic adjustment at a time interval, as taught by Koyanagi, in the system disclosed by Brunner, Kato, Riconda, and Jones. The motivation would have been to save on computing cycles, by only performing the calculations at given intervals even though the system is constantly changing.

Referring to claim 30, Brunner, Kato, Riconda, and Jones do not disclose a method of claim 29 wherein the dynamic adjustment is an adjustment rate that is applied continuously during the time interval.

In an analogous art, Koyanagi teaches a method of claim 29 wherein the dynamic adjustment is an adjustment rate that is applied continuously during the time interval (figure 6).

At the time of the invention it would have been obvious for one of ordinary skill in the art to perform the dynamic adjustment at a time interval, as taught by Koyanagi, in the system disclosed by Brunner, Kato, Riconda, and Jones. The motivation would have been smooth the movement of the camera by changing the speed at intervals instead of constantly, which would cause a jerking motion.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin E. Shepard whose telephone number is (571) 272-5967. The examiner can normally be reached on 7:30-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Kelley can be reached on (571) 272-7331. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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